



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/930,219

08/16/2001

Michael Clinton Johnson

D-21, 109

9456

27182

7590

08/24/2004

PRAXAIR, INC.

LAW DEPARTMENT - M1 557

39 OLD RIDGEBURY ROAD

DANBURY, CT 06810-5113

EXAMINER

DUONG, THANH P

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/930,219	Applicant(s) JOHNSON ET AL.	
	Examiner Tom P Duong	Art Unit 1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on 16 August 2001.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) 1-7 is/are pending in the application.

4a) Of the above claim(s) 3-7 is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) 1 and 2 is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☒ Claim(s) 1-7 are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some * c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.

2. ☐ Certified copies of the priority documents have been received in Application No. _____.

3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>8/16/01</u> .	4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) 6) <input type="checkbox"/> Other: _____.
---	---

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-2, drawn to an apparatus useful for purifying a gas stream, classified in class 422, subclass .
- II. Claims 3-7, drawn to a method for purifying a gas stream, classified in class 423, subclass 210.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process as claimed can be practiced by another materially different apparatus such as a wet scrubbing apparatus without the use of a catalyst system.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Donald T. Black on 7/15/04 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-2. Affirmation of this election must be made by applicant in replying to this Office action. Claims 3-7 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stauffer (4,296,088) in view of Bayer (2,029,604). Stauffer discloses an apparatus useful purifying a stream (Fig. 3), comprising: a shell-and-tube heat exchanger (Fig. 3) comprising a shell inlet (1q) and a outlet (1e) in communication with shell inlet, and further comprising a plurality of tubes (1d) each having an inlet and an outlet; a catalyst system (1s) comprising a catalyst supported on a monolithic unitary support having passages therethrough, the support having length and upstream and downstream ends opposite ends of the length, and downstream end of said support is connected in fluid communication with the inlets of said tubes passageway whose length does not exceed the length support and whose diameter is at point less the diameter of said and a source of gas (gas inlet at 1q) to be purified in fluid said upstream end of said support. Stauffer does not disclose the diameter (best understood to be the longitudinal length of the support) of said support is from one-half to two times of the shell of the heat exchanger. Bayer teaches the height (longitudinal length) of the catalyst layer 7 can be optimized to control the speed and concentration of the gases in order to obtain an

optimal reaction temperature. Thus, it would have been obvious in view of Bayer to one having ordinary skill in the art to modify the catalyst stage of Stauffer with an optimum catalyst height including one-half to two times of the shell of the heat exchanger in order to obtain an optimum reaction temperature for a given gases concentration. With respect to the catalyst supported on a monolithic unitary support, it is conventional to provide a catalyst on a monolithic support such as a honeycomb structure and it would have been obvious to do so here in order to provide adequate support to the catalyst layer.

2. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Siegfried et al. (3,317,278) in view of Stauffer '088 and Bayer '604. Siegfried '278 discloses an apparatus (Figure 1B) useful for purifying a gas stream (Col. 1, lines 19-11), comprising (a) shell-and-tube heat exchanger (19) comprising shell inlet (via feed line 38) and a shell outlet in fluid (exit line 45) communication with the shell inlet, and further comprising a plurality of tubes (tubes inside 39) each having an inlet and an outlet and an outlet; and the first outlet (40) of the heat exchanger is connected fluid communication upstream end the catalyst support (43). Siegfried fails to disclose a catalyst system comprising a catalyst supported monolithic unitary support having passages therethrough, the having a length and upstream opposite ends of the length, of said support is from one-half two times diameter of the exchanger, and wherein the downstream end is connected in fluid communication with inlets tubes by a passageway whose length does exceed length of the support and whose diameter point less than the

Art Unit: 1764

smaller of the diameter of said support and diameter said shell; and a source of gas be purified fluid said upstream end said support. Stauffer '088 teaches an apparatus useful purifying a stream (Fig. 3), comprising: a shell-and-tube heat exchanger (Fig. 3) comprising a catalyst supported on a monolithic unitary support (catalyst stage 1s), which is integrally built-in with the shell and tube exchanger. The support has a length with upstream and downstream ends opposite ends of the length, and downstream end of said support is connected in fluid communication with the inlets of said tubes passageway whose length does not exceed the length support and whose diameter is at point less the diameter of said and a source of gas (gas inlet at 1q) to be purified in fluid said upstream end of said support. Thus, it would have been obvious in view of Stauffer to one having ordinary skill in the art to modify the apparatus of Siegfried '278 with a catalyst system integrally built-in with the heat exchanger in order to minimize piping cost, installation cost, and space. Note, the use of a one piece construction instead of the structure disclosed in [prior art] would merely a matter of obvious engineering choice (See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCP A 1965)). Siegfried and Stauffer do not disclose expressly the diameter (best understood to be the longitudinal length or height of the support) of said support is from one-half to two times of the shell of the heat exchanger. Bayer '604 teaches the height (longitudinal length) of the catalyst layer 7 can be optimized to control the speed and concentration of the gases in order to obtain an optimal reaction temperature. Thus, it would have been obvious in view of Bayer to one having ordinary skill in the art to optimize the catalyst system height of Siegfried and/or Stauffer in order to obtain an

optimum reaction temperature for a given gases concentration. With respect to the catalyst supported on a monolithic unitary support, it is conventional to provide a catalyst on a monolithic support such as a honeycomb structure and it would have been obvious to do so here in order to provide adequate support to the catalyst layer.

3. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over prior art Admission in view of Stauffer '088 and Bayer '604. Admission discloses an apparatus (Figure 1) useful for purifying a gas stream, comprising (a) shell-and-tube heat exchanger (102) comprising shell inlet (101) and a shell outlet in fluid (107) communication with the shell inlet, and further comprising a plurality of tubes (tubes inside 102) each having an inlet and an outlet and an outlet; and the first outlet (feed line between heater 103 and catalyst vessel 104) of the heat exchanger is connected fluid communication upstream end the catalyst support (catalyst support in vessel 104). Admission fails to disclose a catalyst system comprising a catalyst supported monolithic unitary support having passages therethrough, the having a length and upstream opposite ends of the length, of said support is from one-half two times diameter of the exchanger, and wherein the downstream end is connected in fluid communication with inlets tubes by a passageway whose length does exceed length of the support and whose diameter point less than the smaller of the diameter of said support and diameter said shell; and a source of gas be purified fluid said upstream end said support. Stauffer '088 teaches an apparatus useful purifying a stream (Fig. 3), comprising: a shell-and-tube heat exchanger (Fig. 3) comprising a catalyst supported on

Art Unit: 1764

a monolithic unitary support (catalyst stage 1s), which is integrally built-in with the shell and tube exchanger. The support has a length with upstream and downstream ends opposite ends of the length, and downstream end of said support is connected in fluid communication with the inlets of said tubes passageway whose length does not exceed the length support and whose diameter is at point less the diameter of said and a source of gas (gas inlet at 1q) to be purified in fluid said upstream end of said support. Thus, it would have been obvious in view of Stauffer to one having ordinary skill in the art to modify the apparatus of prior art Admission with a catalyst system integrally built-in with the heat exchanger in order to minimize piping cost, installation cost, and space. Note, the use of a one piece construction instead of the structure disclosed in [prior art] would merely a matter of obvious engineering choice (See *In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCP A 1965)). Admission and Stauffer do not disclose expressly the diameter (best understood to be the longitudinal length or height of the support) of said support is from one-half to two times of the shell of the heat exchanger. Bayer '604 teaches the height (longitudinal length) of the catalyst layer 7 can be optimized to control the speed and concentration of the gases in order to obtain an optimal reaction temperature. Thus, it would have been obvious in view of Bayer to one having ordinary skill in the art to optimize the catalyst system height of prior art Admission and/or Stauffer in order to obtain an optimum reaction temperature for a given gases concentration. With respect to the catalyst supported on a monolithic unitary support, it is conventional to provide a catalyst on a monolithic support such as a

Art Unit: 1764

honeycomb structure and it would have been obvious to do so here in order to provide adequate support to the catalyst layer.

Conclusion

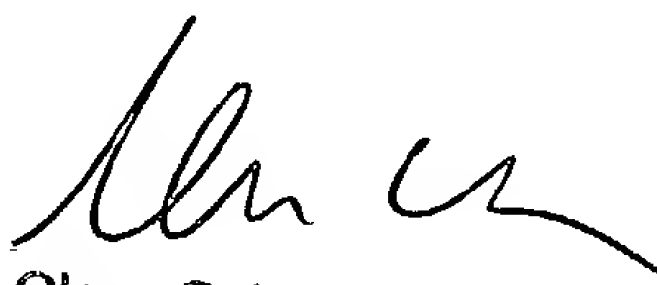
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom P Duong whose telephone number is (571) 272-2794. The examiner can normally be reached on 8:00AM - 4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tom Duong
August 2, 2004

TD


Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700